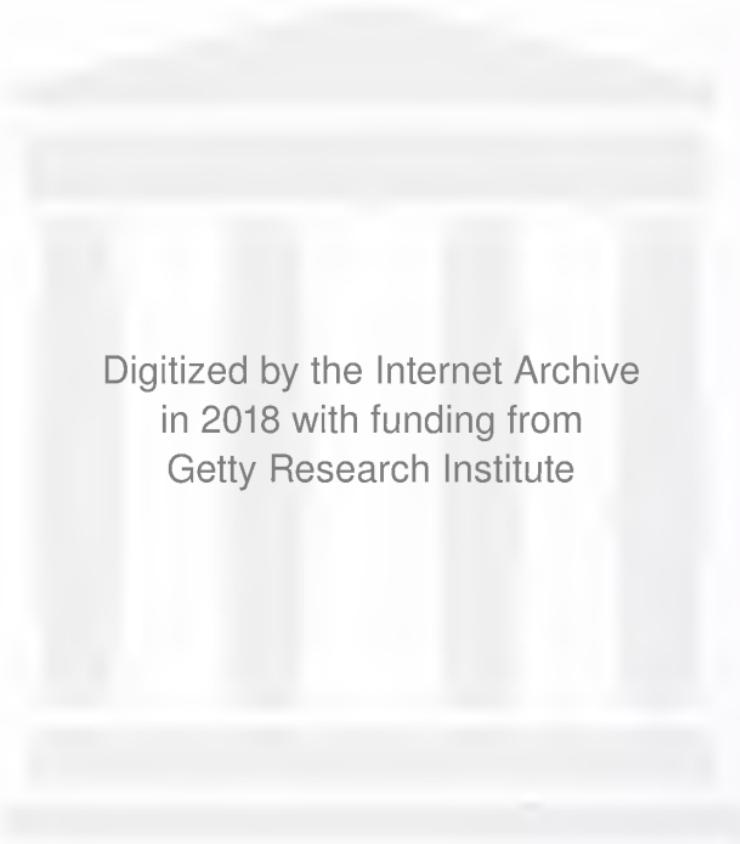


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GENERAL REMARKS ON LINEAR PERSPECTIVE.

ADAPTED FROM THE FRENCH

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LINEAR PERSPECTIVE.*

THE THEORY OF PERSPECTIVE, ITS DEFINITIONS AND PRINCIPLES; OBSERVATIONS ON THE EFFECTS IN NATURE UPON WHICH THEY ARE DEPENDENT.—REMARKS ON THE POINT OF SIGHT AND ON THE PRINCIPAL POINT OF THE PICTURE; ALSO ON THE PRINCIPAL DISTANCE, ON THE HORIZONTAL LINE, VANISHING LINES AND POINTS, ETC.

According to geometry, Perspective consists in representing on a plane surface, of which the form and position are known, any objects as they would appear to an eye which should be placed at a given spot.

If we suppose that a straight line moves freely in any direction from a fixed point, and, without quitting this point, travels round the extremities of a given object, and that this line in its course intersects a plane surface on which it leaves the outline of the

* Linear Perspective requires no ground-plan, but is the application of a few simple problems in descriptive geometry. It is better suited for the general use of artists than the ground-plan method employed by architects and engineers. The preceding pages by Miss RUNCIMAN furnish the student with examples of Linear Perspective.—ED.

object that it has travelled round, this outline will be a perspective projection of the object.

The eye being placed at a fixed point, the line from it is a visual ray, the plane surface intersected is the picture, and the outline made by the ray on this picture is the perspective appearance of the object.

According to painters, Perspective is the art of tracing on a picture all sorts of objects with sufficient exactness for these painted objects to appear as if they were real, and as if they were seen behind this picture imagined as a transparent plane.

This last definition is incomplete; but it suffices for the art of painting, which admits some licence in this practice of Perspective. As we meet, in different treatises on Perspective, with divers names and terms which mean the same thing, we will, in order to remove all difficulty, commence with a set of such definitions as are essential.

We shall readily understand the theory of Perspective if we suppose that our eye is placed at a fixed spot, and that a transparent plane is set up perpendicularly between us and the natural objects that we wish to represent, in such a manner that we can see them through this plane and trace them on the surface: this tracing will be the exact perspective of the objects. It is by following out the result of such an assumption that means have been found to trace on a picture not transparent the perspective representation of a natural

object, provided that its form, its dimensions, and the space that it ought to occupy are known to us.

DEFINITIONS OF THE NAMES AND TERMS EMPLOYED IN PERSPECTIVE BY DIFFERENT AUTHORS.*

A *visual ray* is the straight line along which a luminous point travels to arrive at our eye.

The *optical angle* is that which is formed at the eye by the two rays which start from each extremity of the object.

The *optical cone* is the collection of innumerable rays starting from all the points of visible objects, which are its base, and meeting at the centre of the eye, which is its summit.

The *point of sight*, or point of the eye, is the summit of the optical cone.

The *principal* or *central ray*, the axis of this optical cone, is the perpendicular dropped from the eye to the picture.

The middle of the picture or *central point* is what most authors have improperly called the point of sight, or point of the eye ; this point is the section of the principal ray on the picture,

The *picture*, or plan of projection, usually placed

* The first term that we shall quote in each definition will be that which we shall make use of in the course of this book.

6 DEFINITIONS OF THE NAMES AND TERMS.

vertically in front of the spectator, is the limited surface on which one represents the object; and the *plane of the picture* is this same surface prolonged indefinitely in all directions.

The *principal distance*, or distance of the eye, is the direct interval between the eye of the spectator and the picture, traversed by the principal ray.

The *natural horizon* is that circular line which appears to separate the sky from the earth when no obstacle interferes with the whole extent of the view; the eye of the spectator being the centre of this horizon.

The *horizon of the picture* is the *horizontal line* which passes through the principal point. The *principal vertical line*, or *vertical line* of the picture, is a line which also passes through the principal point and which is perpendicular to the horizon.

Points of distance are points placed on the horizon, or on the vertical line of the picture, and which are removed on both sides from the principal point as far as the principal distance that they represent.

The *ground-plan* is the surface on which the objects are placed that are to be represented in the picture.

The *perspective plane* is that part of the picture which is comprised between its base and its horizon.

The *base of the picture* is the intersection of the plane of the picture with the ground-plan.

The term *natural object* is applied to everything

that we propose to represent, whether natural or artificial.

The terms *perspective elevation* and *projection* of the natural object are used for its representation in perspective in the picture.

Vanishing points are those at which retiring lines, parallel to each other, meet, or towards which they converge; for instance, the *principal point* is the vanishing point of all the lines at right angles to the plane of the picture; and the distance points placed on the horizontal line are the vanishing points of all the horizontal lines that make half a right angle (45°) with the plane of the picture. All the other vanishing points are called *accidental ones*: *super-horizontal* those that are above the horizontal line and *sub-horizontal* those that are below it.

Parallel surfaces or lines are those that are parallel to the plane of the picture.

Retiring surfaces or lines are those that are not parallel to the plane of the picture.

The *perspective width* of an object is its horizontal dimension when parallel to the plane of the picture; its *perspective height* being its vertical measurement under the same condition.

Depth in perspective is the measurement of a retiring surface calculated from the eye to the horizon; for example, the total depth of the perspective plan of a picture is the space which extends from its base to the horizon.

A *plain* or *geometrical scale* is a straight line parallel to the plane of the picture and divided into equal parts, which represent certain recognised measurements : it is usually placed below the picture.

A *retiring scale* is a straight line represented as being on the perspective plane of the picture and directed from its base to its horizon ; this scale is divided into parts diminishing perspectively, which represent equal measurements.

REMARKS ON THE DIFFERENT APPEARANCES THAT
THE SAME OBJECTS PRESENT TO OUR EYES,
ACCORDING TO THE DISTANCE AT WHICH THEY
ARE SEEN AND ACCORDING TO THEIR VARIED
POSITIONS; ON WHICH APPEARANCES THE PRIN-
CIPLES AND RULES OF PERSPECTIVE ARE FOUNDED.

All objects seem to diminish in size in proportion to the distance they are removed from us.

Every object disappears at a greater or less distance according to its size : we presuppose that it is seen under a clear atmosphere, without considering the effect of mist, smoke, &c.

Parallel lines continued to a great distance appear to approach each other, and to meet in a point at their extremities if continued far enough : a long avenue of trees exemplifies this effect.

A horizontal plane at the level of the eye will appear

as a straight line, because we only see the extremity of the plane.

A horizontal surface placed below the level of the eye appears to rise as it recedes ; such is the effect of the sea or of a very extensive plain, which seem to rise towards the horizon.

A horizontal surface placed above the level of the eye seems to get lower as it recedes ; this effect is produced by the ceiling of a long gallery.

The same cause produces all these effects : that is to say, the apparent diminution in the size of the objects and of the distances between them in proportion as they are removed from us.

If a straight line, divided into equal parts, is seen in front, its divisions will always appear equal ; but if this line is seen obliquely, its equal divisions will appear unequal.

Lines actually parallel when seen in front always appear parallel in perspective.

The perspective of any plane figure, when parallel to the plane of the picture, is a figure resembling the original : thus a square, a circle, or a polygon, when parallel to the plane of the picture, do not change their form in perspective, but only their size according to their distance from the eye ; but when these figures are presented obliquely to our eyes they appear changed in form, the circle having the appearance of an oval, the square that of a trapezium, &c.

A straight line which is identical in direction with a visual ray only appears to the eye as a point.

A surface on which a visual ray can be laid down only appears to the eye as a line, because we only see its extremity, which is a line.

Lastly, a solid which only presents to view one of its sides appears as a simple surface.

REMARKS ON THE POINT OF SIGHT AND THE PRINCIPAL POINT.

In a picture we can only represent an object in a single position, an action or scene at a single instant, a view from a single point.

When we wish to draw or paint an object (or view) from Nature we usually place ourselves at a spot from which we can see easily, without being obliged to turn the head, the extremities of the object that we wish to represent, in such a way that the axis of the visual cone, or principal ray, is directed towards the middle of the object. It is the same in looking at and judging the effect of a picture ; for we naturally place ourselves opposite the middle of a picture, unless there is some special reason to the contrary, such, for instance, as an unpleasant reflection from a varnished surface in certain lights.

It follows from these remarks that all that is repre-

sented in a picture ought to be subordinated to a single point of sight, and that the principal point ought to be placed about the middle of the horizon of the picture, unless there is some special reason to the contrary. For instance, if to ornament the end of a gallery we wished to paint several pictures by the side of each other, with the idea of their being seen from a certain given spot, and to produce the utmost illusion possible, it might be that the principal point would be found in neither one nor the other but between the two; for it would be necessary that these several pictures should be subordinated to a single point.

The principal point is the vanishing point of all the lines perpendicular to the surface of the picture.

When the position of a rectangular edifice is such that one of its sides is parallel to the picture, which may be easily recognised by noticing that the horizontal lines, such as cornices, window-sills, &c., on this side appear parallel to each other, then these same lines as they recede along one of the retiring sides of this edifice will be examples of lines which are said to be perpendicular to the picture: they should tend to meet at the principal point, which is their vanishing point.

Rectangular edifices may be so disposed that none of their horizontal retiring lines tend to the principal point. So that, though we have observed that it is

necessary for all the objects represented in a picture to be subordinated to a single point of sight, we must not conclude that all horizontal retiring lines ought to meet at the principal point.

REMARKS ON THE PRINCIPAL DISTANCE.

In the practice of Perspective the principal distance may be either given at first, taken as required, or indeed left undetermined. With reference to the distance, it is necessary in the first place to remark that we cannot see an object properly when we are either too near or too far off, and that the effect and success of a picture often depend upon a suitable choice of this distance.

The disagreeable effect that many perspective drawings produce is nearly always the result of choosing too short a distance at which to represent the objects drawn.

Natural objects can be seen from all points and under all aspects and yet appear always agreeable, because they are presented always directly to the sight whatever their position may be; or, rather, because we direct our attention to each one of the objects in turn. But the same objects represented on the surface of a picture have not this advantage: they cannot produce a satisfactory illusion if the distance at which to see and paint them properly has not been suitably selected.

The distance will be sufficient if when standing opposite the point of sight we can easily see at once all the limits of the picture.

All the objects represented in a picture ought to be subordinated to the same distance, and the distance may be regulated by a given object. In practice, painters hardly ever determine with precision the principal distance; but when they have sketched on their picture some symmetrical object of which their taste approves the appearance, they have unconsciously determined this distance, which is throughout the rest of the design subordinated to this first object, and very often there is no occasion to fix it absolutely. Sometimes, however, it is necessary to find it in order to complete the work which may have been commenced without it.

ESSENTIAL REMARKS.

When, in order to look at a picture which has been drawn according to the rules of perspective, one is placed at its point of sight—that is to say, at the distance selected as suitable by the painter—this picture, properly painted, ought to produce the utmost illusion possible.

If to inspect this same picture one approaches closer, so as to be between its point of sight and its surface, the objects represented will still preserve their forms

agreeably ; only this surface, of which one will not be so easily able to see the whole extent, will seem to retire from the eye. But if, on the contrary, one places oneself further than the point of view chosen by the artist, the objects represented will appear more or less distorted. It is especially in pictures which represent architecture, or in symmetrical objects, that these effects will assert themselves most noticeably.

It is therefore preferable that the principal distance should be made rather greater than less, in order that the spectator of the picture should rather be disposed to place himself too near than too far off ; so that, in all the cases where we wish to settle the point of distance at first, it will be advisable to place it at the most distant spot at which the picture can be seen satisfactorily.

Objects put into perspective according to the rules but at too short a distance are not agreeable to the eye. We can prove this statement by referring to the examples engraved in many well-written treatises on the subject, in which the points of distance have been placed at the sides of the picture in order to render the instructions more clear and intelligible. These figures, occurring in excellent books, have caused many people to imagine that scientific perspective is at fault, because such representations of objects appear unmistakeably distorted.

All the authors who have pretended to give rules

for establishing the principal distance have only advanced private opinions on the subject, for there does not exist any general rule.

In several treatises on Perspective we find rules for determining the principal distance : some fix it at the angle comprised in the quarter of a circle, others at the angle comprised in the sixth part, while again others make it equal to the largest dimension of the picture. Without prejudging these rules, we are going to instance those of the celebrated painters and architects who have combined example and precept.

Leonardo da Vinci says that, to design an object from Nature, it is necessary to be removed from that object at a distance equal to three times its height ; elsewhere he advises making the principal distance equal to double the size of the picture. To reconcile these two passages of Leonardo, which appear contradictory, it must be noticed that the object of which he speaks at first—for instance, a human figure—ought not to occupy the whole surface of the picture on which it is represented, and that thus the principal distance may be at the same time three times the height of the figure and double the size of the picture.

Balthazar Perruzzi and, after him, Sebastian Serlio, his pupil, have also established the distance on the dimension of the picture, and have made it equal to one and a half times the measurement of its base.

Ignazio Danti, in his commentaries on the Perspective of Vignola, says that the pupil of the eye can admit an angle slightly larger than the sixth part of a circle ; but that, as a picture ought to be seen at a glance and without moving the head, this angle would produce too short a distance : that we must therefore suppose the angle more acute, in order that the distance may be greater, and that the extremities of the visual pyramid may be better seen ; that he himself decided to take for *distance* the height of a triangle of which the base is equal to two-thirds of this height, and even to half in certain cases. He found that by this means the two great inconveniences which result from too short a distance are avoided : the one is that horizontal surfaces appear to slope upwards too suddenly as they retire, and the horizontal eaves of buildings to slope downwards too much ; the other is that a marked-out square is apt to appear deeper than it is wide.

There is a letter extant of Nicholas Poussin in which he refers to his selection of the point of distance for the pictures that he painted to adorn the grand gallery of the Louvre. "It must be observed," he writes, "that the wainscot of the gallery is twenty-one feet high and twenty-four feet long from one window to another ; the width of the gallery, which determines the distance for viewing the wall-space, is also twenty-four feet ; the central panel of the wain-

scot is twelve feet long by nine feet high ; so that the width of the gallery gives a distance suitably proportioned for seeing at a glance a picture which should fit the panel." It will be seen by these measurements that the *distance* is equal to twice the base of the picture ; the book on Perspective by Desargue, which A. Bosse sent to Poussin, at Rome, also confirms this choice. But Poussin did not confine himself exclusively to this distance.

Modern oculists affirm that, in order to see at once easily and clearly all the extremities of an object, the eye must be removed from that object at a distance at least equal to double its greatest dimension. However, it is to be remarked that in several of the most celebrated pictures (among others in Raphael's School of Athens) the principal distance is only about that of the base ; but we believe it will never be found to be less than the base or width of the picture.

Lastly, we will observe that architects, who usually employ a ground-plan and geometrical elevation of a building in order to put it into perspective, first determine the point of view, which settles at the same time the principal distance ; but that painters, as we have already pointed out, only indicate this distance by its effects, unless they should have some special reasons to determine it.

REMARKS ON THE NATURAL HORIZON AND ON THE HORIZON OF THE PICTURE.

The natural horizon is a circular line; but this line, being on a plane at the level of the eye (which is at its centre), appears straight. At a glance, and without turning the head, one can only see a part of the horizon, which invariably appears at the level of the eye of the spectator, wherever he may be placed.

The character of the country, whether mountainous or not, in which painters dwell, often influences their taste in the determining whereabouts in their pictures the horizon should be placed. Thus it may be noticed that in the pictures of the Italian school the horizons are usually very high, while on the contrary they are very low in the pictures of the Dutch and Flemish schools.

The horizon of a picture is the first thing that should be decided on, as all the objects in the picture must be subordinated to this one horizon.

When one is sketching a landscape from Nature the horizon is invariably fixed. If the view is bounded by the sea, the horizon is visible; if not, one must find it, which is not difficult: for, if the painter imagines a line on the level of his eye, and supposes this line to

reach to a point on some visible object, this point will give him the height of the horizon with sufficient exactness for the purposes of his picture.

We would here remark that a picture placed vertically in a suitable position will not produce all its effect unless its horizon is at the height of the spectator's eye or—still better—rather below it. It is also the advice of Poussin; who, in the postscript of a letter written from Rome to M. de Chanteloup, to announce the sending to him of one of his pictures, adds, "Before showing it, it would be advisable to frame it, and it ought to be placed rather below than above the eye."

We will add, lastly, that a picture put in an elevated position will only produce all the illusion possible when it is tilted forward in such a manner that a ray from the eye of the spectator, placed at a suitable distance, arrives perpendicularly to the horizon of the picture.

There does not exist any certain rule for fixing the height of the horizon when composing a picture; it depends upon the taste of the painter, his choice of subject, and the extent of the view to be represented.

Leonardo da Vinci says that he who wishes to draw a human figure from Nature ought to place himself so that the eye of his model should be on a level with his own; but this is only with reference to portraiture, and is, after all, but an individual opinion.

In historical pictures and other works of imagination the painter is at liberty to place the horizon at three different heights relatively to the human figures that he wishes to represent : either on a level with the eyes of these figures, or above that level, or below it. In the first case the painter is supposed to be standing or sitting on the same ground as his models ; in the second case he is supposed to be on higher ground ; and in the third case on lower.

These remarks, the importance of which will appear later on, teach us to judge at a glance whether the human figures in a picture which was supposed to be on level ground, but at different distances, are designed correctly in perspective ; they also teach us to put figures into pictures with the diminished height that they should each have according to their respective distances from the plane of the picture.

REMARKS ON THE VANISHING POINTS.

Since parallel retiring lines, prolonged to a very great distance, appear to approach each other and to meet at last in a single point, if we imagine a visual ray directed to this point, this ray will then be parallel to these lines ; and, conversely, if lines appear to meet at a point with a visual ray, these lines will then be parallel to this ray.

In effect, if with the eye fixed in one spot we trace on a transparent vertical plane, such as a window, the parallel retiring lines seen through it, we shall see that the lines thus traced will meet at the point indicated by the track of the visual ray on the window parallel to the lines referred to.

It follows from this, that, in order to find in a picture the vanishing point of as many original parallel lines as one wishes to represent, it will be sufficient to direct a ray from the eye parallel to these lines. The section of this ray on the surface of the picture will be the point of sight to which the perspective appearances of these parallels will tend.

This is the general principle of the vanishing points which Guido Ubaldo first published in his book on Perspective printed in 1600 ; but he only applied this principle to the parallel lines on the horizontal and vertical planes ; it has since been applied to parallel lines on all the inclined planes, whatever their position. Thus, if we suppose the plane of the picture infinitely extended, the appearance of all the parallel lines which are at any inclination to this plane will have a vanishing point on it. But the appearance of all those lines which are at the same time parallel to each other and to the plane of the picture cannot have a vanishing point on this plane. Since they never reached it, they do not meet, and remain always parallel in the perspective view. Vanishing points are very useful

22 GEOMETRICAL AND PERSPECTIVE SCALES.

in the practice of Perspective, for not only do they shorten the operations but they give them more precision.

Lastly, it must be observed that the vanishing points are often found to be beyond the limits of the picture ; they are then inaccessible, or considered as such, and must be supplied. We have recourse to geometry, which gives several methods of obtaining them.

REMARKS ON THE GEOMETRICAL AND PERSPECTIVE SCALES : THAT IS TO SAY, PLAIN AND DIMINISHING SCALES.

Plain scales serve to determine questions of height and width in perspective representations : that is to say, the dimensions of all the objects on the planes of surfaces parallel to the plane of the picture.

Diminishing scales serve to determine questions of depth in perspective : that is to say, the dimensions of objects on planes which retire from the base of the picture towards its horizon.

All the objects which enter into the composition of a picture can mutually serve to establish their relative proportions ; but the most natural standard of measurement, the oldest and at all times the most familiar to the painter, is the stature of the human figure. Pythagoras says that “ man is the measure

of all things, because everything can be compared to him ; "and another ancient writer, in describing the lighthouse of Alexandria says "that its height was three hundred cubits, or one hundred statures ;" meaning by this word the average height of a man. We still use the expression, and say that a man is of high, average, or low stature.

We employ this standard of measurement, which, being only relative and able to be established arbitrarily, will serve for scale ; especially for historical and genre painters, who ordinarily begin by determining on their canvas the height of one of the figures, and who afterwards design all the other objects in proportion with this figure. To use this standard measurement of stature as a scale we can divide it into an equal number of parts. It is in this way that Tomaso Lauretti, a Sicilian painter, made a graduated scale, hitherto unknown : he divided the stature into eight heads, and subdivided the head into four equal parts ; he put these measurements into perspective, and formed squares, which by their gradual diminution not only gave him the height of a human figure, but also the measurement of each part of this figure at all the planes of his picture.

All the objects, in painting, appear large or small according to their relations with any human figure that may be in the picture : it is doubtless by this comparison that Timanthes made the Greeks admire

the gigantic stature of a sleeping Cyclops that he had painted in a picture, along with three little Satyrs who measured, with their thyrsi, the great toe of the sleeper.

COMMON FAULTS IN PERSPECTIVE.

The most noticeable faults that occur in pictures, and which strike the eye unpleasantly, are caused, firstly, by the distance being badly chosen (generally too short); and, secondly from the horizon being undetermined or badly placed with reference to the objects represented, or from those objects being badly placed with regard to the horizon. We have already observed that the spectator is placed too near an object to draw it properly when he cannot easily see its whole extent at a glance, and is obliged to turn his head to one side and the other in order to see its extremities. A faithful representation—that is to say, the exact perspective appearance—of an object taken in this manner appears defective: its right angles appear acute, its horizontal planes above and below the eye seem to rise or descend too rapidly, its retiring sides seem too deep, and the whole appears distorted and disagreeable. Thus it often happens that in spite of correct drawing from Nature a painting is disfigured through ignorance, not of the rules, but of the principles of perspective. That a suffi-

ciently long distance should be chosen is the condition of all others requisite for producing an agreeable perspective representation. If this condition is not fulfilled—and we cannot too often repeat the remark—the picture will offend the eye ; and the more truthfully the view is rendered the more disagreeable will be its effect.

In the case of a panorama, the perspective is not controlled by any principal vanishing point, because the visual rays are perpendicular to its cylindrical concave surface. Experience has even taught us that it is not absolutely necessary to be at the centre of the panorama to enjoy its effect.

We have already observed that it is necessary that all the objects represented in a picture should be controlled by its horizon ; and that when a painter has designed any figures the horizon of the picture is determined, and that this horizon ought to regulate all the other objects which enter into the composition. Portraits are frequently painted with the horizon about the height of the eye, showing that the painter and his sitter were on a level ; and yet the backgrounds will be controlled by a totally different horizon. The result is unsatisfactory to most spectators, who see that there is something wrong but cannot tell what it is that interferes with the proper unity of effect.

We will now allude to a fault of perspective caused by the horizon not having been determined in the

picture. The picture referred to represented a landscape in which were painted several figures on a level road at different depths in the picture. These figures had no relative proportion to each other : those far in the picture, much too small, seemed to be pygmies compared with those in the foreground of the picture ; for in supposing the horizon determined by the near figures, those far in would have had a quarter of a stature in height. One could not suppose that the ground on which the figures were placed became lower as it retired, because it bordered a lake, the horizontal surface of which followed that of the ground at a slightly lower level.

We will also allude to another error in perspective, doubtless resulting from the carelessness of the artist, since the horizon was represented in the picture. A human figure was placed on the summit of an edifice which stood well above the horizon, but was so represented that one saw at once up under the feet of the figure and down on to the shoulders.

Besides the faults we have pointed out, the most common errors in perspective occur, firstly, when all the objects which compose a picture (as figures, buildings, landscapes, &c.) have been designed from different distances—that is to say, are not taken from the same point of view ; secondly, when all the objects represented in the picture are not regulated by the same horizon ; thirdly, when the retiring lines

that the painter has intended to make appear parallel to each other, do not tend to the same vanishing point; and, fourthly, when the buildings are not represented in their proper proportion to the human figures in the picture. We may remark that, in the last case, if it should happen that there are figures in the foreground and buildings further back, and that the buildings are too small relatively to the figures, this error of proportion may be obviated by indicating a change of level between the surface where the figures are placed and that on which the buildings stand. In other words, we suppose the figures to be standing on a kind of terrace, the height of which (above the ground on which the buildings are) cannot be calculated because its base is not seen, but is always imagined to be such as to justify the relative proportions given to the figures and the buildings. Thus, by changing the appearance of height of the ground on which objects rest, we can make these objects appear greater or smaller in perspective without augmenting or diminishing their measured height in the picture.

ARTISTIC LICENCES IN PERSPECTIVE.

If we suppose that a picture, of which the perspective is correctly drawn according to the rules of this art, will only be seen from the point chosen by the artist—that is to say, from the point of view to which all the

objects are conformed—then the most trifling licences cannot be allowed in such a work ; not only would they be useless, but they would mar the effect and the illusion produced. Rigorous precision is absolutely required.

But a picture of large size designed to decorate a large hall or gallery would be seen at the same time by a considerable number of spectators, while it could only be seen from its true point by one person at a time ; and, in order that everybody should see it from this point, it would be necessary that each person should place himself there in turn, which would be impracticable, especially if there was a crowd of spectators. It is not in this way that very large and celebrated pictures are regarded. The spectators, far from remaining at the same spot where they first placed themselves in order to see the general effect, move about to the right and then to the left for the purpose of examining necessarily all the details that compose the work. But let us suppose that this picture has been outlined with geometrical precision, that all the objects which compose it are regulated by a single point of view, and that their perspective projection is rigorously correct ; then this is the result which will be produced : the spectator removed from the point of view and placed opposite either of the ends of the picture, will see the objects in front of him more or less distorted ; for it may happen that, in consequence of

the correct application of the rules of perspective, a human head may appear as wide as it is high, which would be monstrous and ridiculous.

We believe, then, that a painter ought not always to subject himself to the strict laws of perspective ; that it is allowable to take certain licences ; that he ought always to draw his subjects in such a manner that they will be agreeable to the eye from whatever place they are looked at. We do not even think that he can do otherwise ; for all the great masters, ancient and modern, have followed and still follow this method. Thus, according to the usage of the best artists, the whole effect of a large picture ought to be submitted to the laws of perspective, and the objects which compose it ought to be considered relatively to each other, following the rules of this art ; but in order to draw each object in detail, especially human figures, one may and even ought to take some licences, to abandon sometimes the absolute precision of geometry, and to content oneself with such an approximation as good taste can approve. The licences of which we are speaking may have a sort of law which is not rigorous, but of which the eye may be regarded as the final judge.

It is in the representation of buildings and other rectangular objects that the defects of perspective are most apparent.

We will now call attention to several particular

cases which authorize or permit the use of some licences in the practice of perspective.

According to the rules of perspective, the principal point ought to be placed in the middle of its horizon ; but the painters have not always followed this rule, as, for instance, Poussin in his picture of the lame man cured by the Apostles.

When the principal point is removed considerably from the centre of the picture, and a rectangular edifice presents two of its sides, the one parallel and the other perpendicular to the plane of the picture, it happens sometimes that the horizontal lines (which form the eaves, cornices, &c.) of the side parallel to the plane of the picture seem to incline in an unnatural manner, and to rise towards the side of the picture the furthest off from the principal point ; then it is necessary to allow a licence, by inclining slightly the horizontal lines and lowering them from the same side till the eye judges them to be parallel to the horizon. A very slight inclination is sufficient to make them produce this effect.

The perspective projection of a sphere is a circle that can be drawn by a compass when its centre is in the visual ray perpendicular to the plane of the picture—that is to say, at the principal point ; but when the centre of this sphere is more or less removed from this point, its perspective appearance is that of an ellipse more or less elongated. A very simple

experiment will illustrate, so to speak, the scenographic projection of a sphere on a plane.

If we suspend a sphere between a bright light and a wall, we shall see that the shadow of this sphere will be circular as long as its centre is in the perpendicular ray transmitted from the centre of the light on to the wall; but if the sphere is removed more or less from the perpendicular ray, we shall see that the shadow thrown on to the wall will be elliptical, and more or less elongated, according as the projection is cast more or less obliquely. A similar experiment may be made with sunlight by suspending a sphere and changing the position of the plane surface on which the shadow is cast.

The spheres that Raphael has painted in his "School of Athens" are placed at the extreme side of the picture, towards the right. If they were exactly in perspective, their elliptical appearance, considerably elongated, would make an odd contrast to their actual form, which would be the more noticeable as the figures which carry them are not themselves very rigorously in perspective; so Raphael took the liberty of describing these spheres with the compass.

Artistic licences may be taken in all kinds of painting. For instance, when one draws from Nature an exterior or interior view of a building, and one finds oneself with a wall at one's back, or some other obstacle which prevents one from getting far enough

away from the object that one wishes to represent, in order to show it under its most favourable aspect it is necessary to make the spectator believe that the wall or other obstacle did not exist, and that one was quite at liberty as to the spot one should select as the point of view, and so to place oneself where one liked. There is no fear but that the spectator will forgive the artist this licence, or rather this false statement, even if he should know it to be untrue; since it will have been the means of rendering the picture more agreeable, and of increasing his own pleasure in looking at it.

We may say, in conclusion, that no one will be shocked at any licence in perspective that a painter may have taken when it neither offends his eye nor his reason, and while it tends in the direction of grace and beauty.

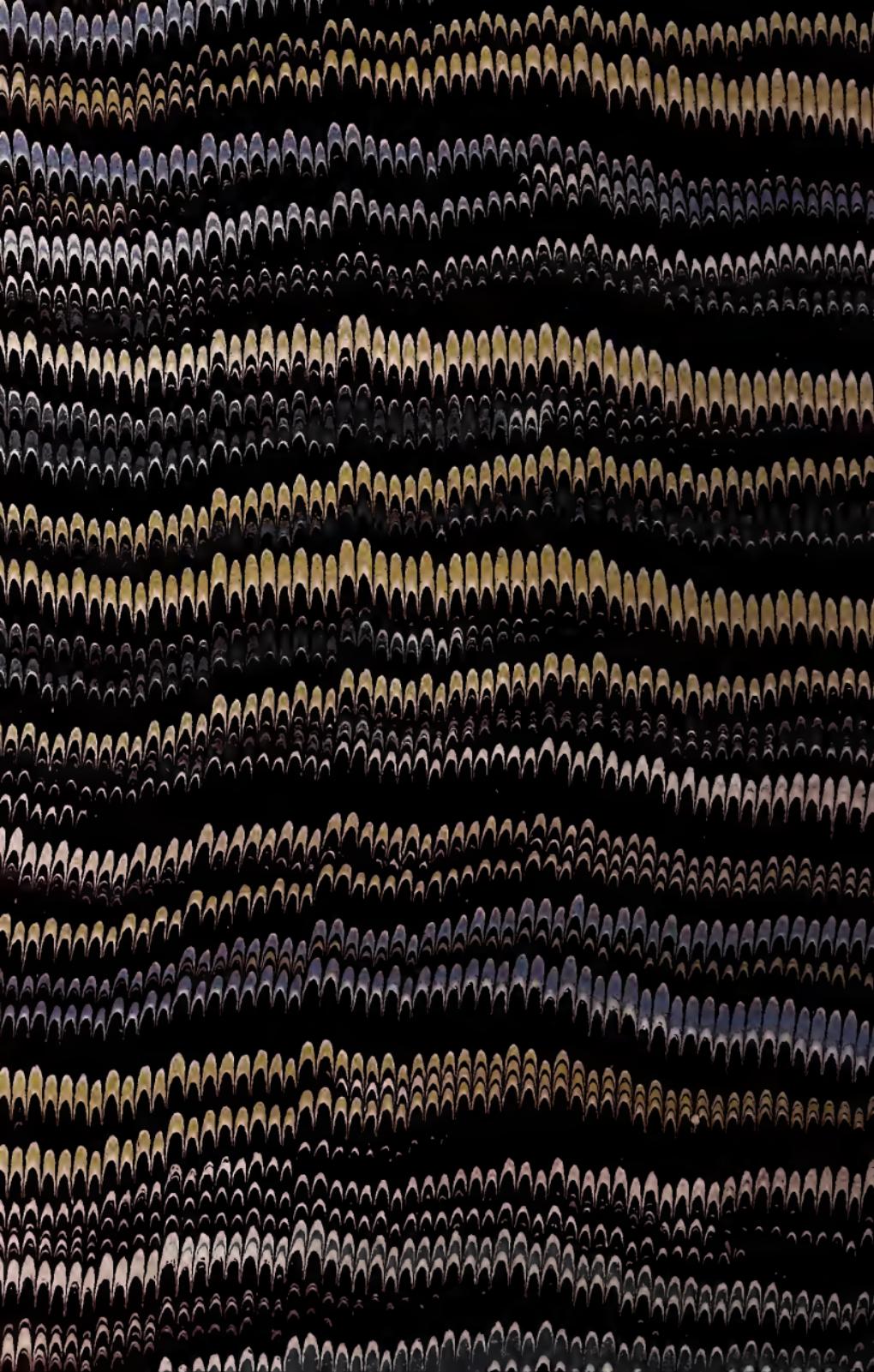
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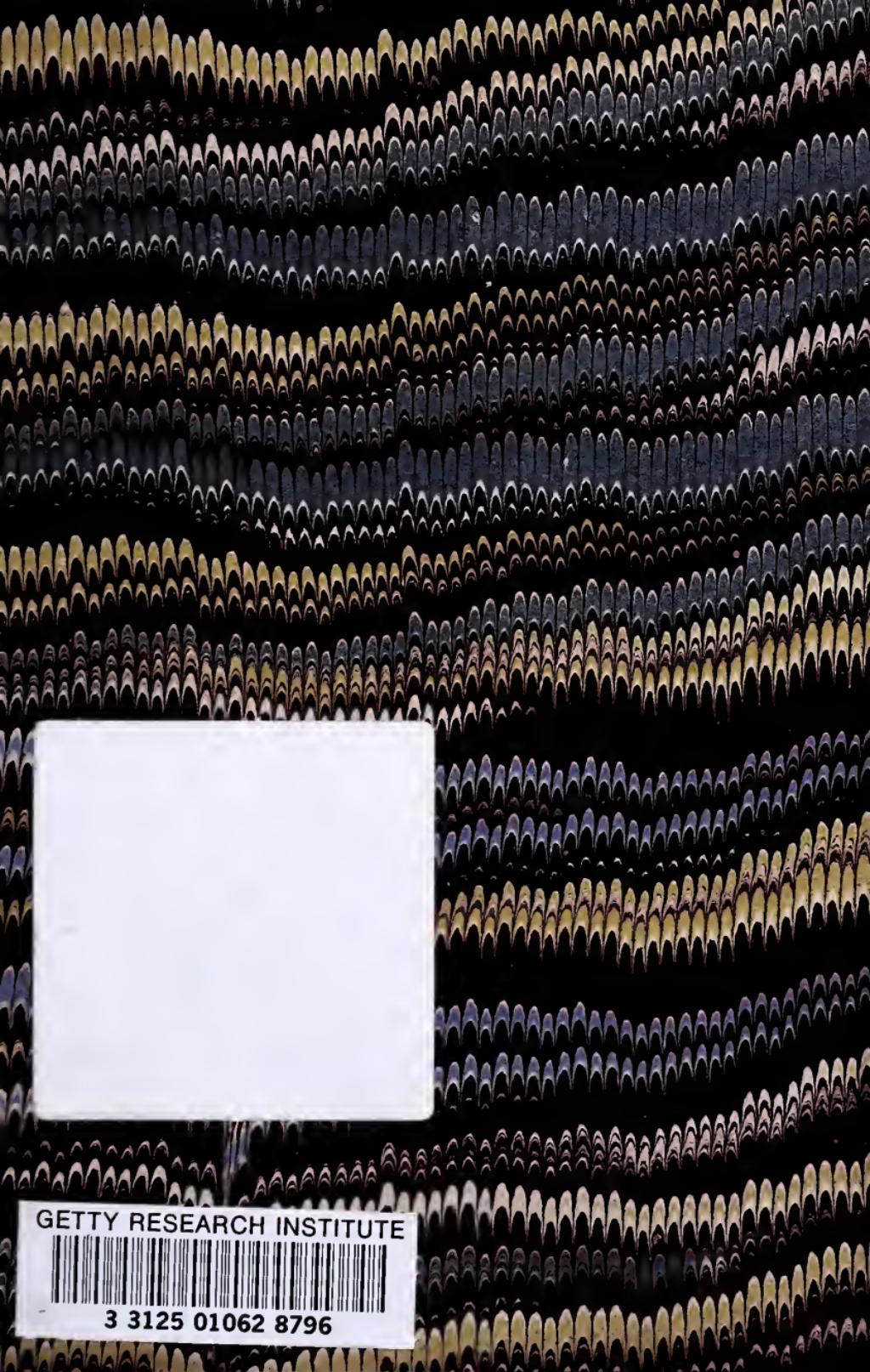


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